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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/678,255	10/03/2000	Masayuki Tanabe	684.3086	4776

5514 7590 06/04/2003

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EXAMINER

SOUW, BERNARD E

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/678,255

Applicant(s)

TANABE, MASAYUKI

Examiner

Bernard E Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment B, filed 03/18/2003 (Paper #8).
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-9 and 11-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-9 and 11-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/03/2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Amendment

1. The Amendment B, filed on 03/18/2003, Paper No.8, in response to the first Office Action dated 11/06/2002 has been entered. The present Office Action is made with all the suggested amendments being fully considered.

Claims 2-4 and 10 have been cancelled and new claims 17-31 have been added.

Accordingly, claims 1, 5-9 and 11-31 are pending in this Office Action.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 03/18/2003 was filed after the mailing date of the Application on 10/03/2000. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner (paper no.7).

Response to Applicant's Arguments

3. Applicant's arguments filed 09/20/2002 (paper no.8/B) have been fully considered but they are not persuasive. The following is the Examiner's response to Applicant's arguments.

► Regarding claims 1-4 *previously* rejected by general knowledge in the art, Applicant's arguing method of first amending the claims by adding a large number of limitations not *previously* claimed, then traversing the Examiner's *previous* ground for

rejection, is improper, since the subject of Applicant's traversal *did not exist*. On the other hand, the Examiner's previous rejections are proper. It is 100% proper to judge an ordinary (toilet) mirror as optical element, a (kitchen) cloth as cleaning instrument, (Applicant's) eye as optical detector, and (Applicant's) brain as information processor and device controller. A change of ground for rejection brought up in this Office Action has been solely caused by Applicant's Amendment on the claims (paper no.8/B), and thus, does not prevent this Office Action from being made FINAL.

It is to be emphasized that a rejection based on *general knowledge in the art* is not made "*in view of the Examiner's knowledge in the art*", as misunderstood by Applicant in paper #8/B, pg.8/line5, pg.9/lines7-8, and many more other pages, but instead, in view of the *general knowledge of any person of ordinary skill in the art*. Therefore, Applicant's argument that "*this knowledge is not known by the public (sic.)*" (pg.9, lines 8-9) is not persuasive. That particular knowledge might well be *unknown to Applicant*, since it depends of course on Applicant's personal level of knowledge & skill in the art, but it is certainly well known to those of ordinary skill in the art (not necessarily to the general public). That this is a *general knowledge in the art* (but *not necessarily known to the general public*), is here evidenced by the many documents issued by commercial companies open to the public cited in previous PTO-892, such as Wang, Edmund and Oriel.

► Regarding new claim 17, Applicant's argument is again *improper*, solely because claim 17 is a *newly added claim*. It is improper to argue over any claim that has never been recited before. Applicant's argument is *even more improper* because the entire

new limitations of claim 17 are *anticipated (under § 102) by the same prior art* that has been applied in the previous Office Action (Mori et al.), of which Applicant should have been aware prior to formulating new claims. Again, Applicant's improperly stated pre-emptive argument does not prevent this Office Action from being made FINAL.

► Regarding Applicant's argument that Mori et al. and Peterson et al. cited as prior arts in the previous Office Action *do not disclose* the specific *cleaning means* recited in Applicant's claims (pg.9/lines 3-4 from bottom), it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although these elements (GC/MS and IR absorption spectroscopy) are found as examples or embodiments in the specification, they were not claimed explicitly. Nor were the words that are used in the claims defined in the specification to require these limitations. A reading of the specification provides no evidence to indicate that these limitations must be imported into the claims to give meaning to disputed terms. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

However, even if Applicant would (have) incorporate(d) those specific limitations, they are all rendered obvious by Mori's and/or Peterson's reference. Mori's method is a photo cleaning process using ozone and/or other forms of active oxygen purged with inert gas(es). While these limitations have not been recited in Applicant's previous claims, they automatically render obvious Applicant's newly added limitations and claims. Specifically, Mori's invention detects the concentration of contaminant gases specified in Applicant's claims based on their *known* transmissivities at characteristic wavelengths. Peterson's alternative method detects the concentrations of such gases

by a mass spectrograph popularly known as Residual Gas Analyzer (RGA) capable of detecting the concentration of all organic (and inorganic) gases specified in Applicant's disclosure. On the other hand, Applicant's disclosure gives *no* technical description of the specific gas concentration detector used in Applicant's invention. Therefore, Applicant's broadly claimed detector and method of gas concentration measurement are completely covered, and hence, rendered obvious, by both Mori's and Peterson's detectors, taken alone or in combination. This is because each of Mori's and Peterson's detector, being defined *narrower* than Applicant's, is sufficient to reject a *broader* limitation as in Applicant's invention.

Note: Even if Applicant would later introduce specific detector limitations into the present claims, i.e., making its limitation narrower --eventually to elude present rejection based on Mori's or Peterson's--, such an effort would be futile in view of the vast number and variety of detectors known in the art that are capable of doing the same job as specified by Applicant, *unless the detector were Applicant's own invention, which is here very clearly not the case*. Just as an example, the UV absorption spectroscopy as cited by the Examiner from Mori et al. is known in the art as being equivalently applicable for measuring the concentration of organic contaminants as the IR absorption spectroscopy (recited in Applicant's disclosure on pg.11/II.6-11 & pg.14/II.15-20, but not specifically claimed). This general knowledge in the art is supported by a large number of prior arts, e.g., DeSisto et al. (USPAT 5,652,431) in Col.1/II.41-45 and Col.1/II. 65-67. Another example, Applicant's periodical check up of contaminants on the optical elements surface using combined gas chromatography & mass spectrometry (GC/MS),

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recited in Applicant's disclosure on pg.11/II.12-15 & pg.12/II.3-5, but not specifically claimed, is known in the art as being equivalently effective as IR absorption spectroscopy. This general knowledge in the art is supported by a large number of prior arts, e.g., Sorita et al. (USPAT 6,175,111 B1) in Col.7/II.45-48. Still another example of general knowledge in the art, Peterson's RGA cited by the Examiner in the previous Office Action is well known in the art as having the *same, or even better* capability than GC/MS (recited in Applicant's disclosure on pg.11/II.12-15 & pg.12/II.3-5, but not specifically claimed) for measuring low component concentration levels of organic contaminants in the ambience of atmospheric pressures. This general knowledge in the art is supported by a large number of prior arts, e.g., Weinberg et al. (USPAT 5,959,297) in Col.3/II.51-58 & 65-68.

Previous Objection Revoked

4. Claim 11 having been properly amended, its previous objection based on misspelling is now revoked.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1, 5-9, 11-13, and new claims 17, 18, 20, 22, 23 and 25, are rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Mori et al. (USPAT 6,268,904 B1).

► Regarding claims 1, 13, 17 and 22, Mori et al. disclose an optical instrument shown in Fig.1, comprising:

- (a) an optical element 21, as recited in Col.6/ll.13-21; and
- (b) a detector, or sensor 24, for detecting an impurity concentration of organic substance in an ambience of a space surrounding the optical element 21, as recited in Col.6/ll.21-34 regarding the ambient space and in Col.6/ll.31-32 regarding the detector that detects an impurity concentration by virtue of its transmittance specifically recited in Col.17/ll.61-67 & Col.18/ll.1-19;
- (c) ozone supplying means for supplying ozone into the ambience, as recited in Col.17/ll.19-28; and
- (d) cleaning means for cleaning the ambience by use of ozone, when the impurity concentration is not less than a predetermined value, as recited in Col.9/ll.4-6 & 24-30 in addition to Col.17/ll.61-67 & Col.18/ll.1-19 already recited previously.

- ▶ Regarding claims 5-8, the limitation of putting the ambience in a state purged with a gas substantially not absorbing light to be propagated through the optical element 21 is recited in Col.17/ll.4-34, wherein inactive gas nitrogen is recited in Col.13/ll.25-34 and specifically helium in Col.13/ll.32-34, whereby the wording "*inert gas*" used in the cited columns & lines inherently means that the specified gas does not absorb light in the wavelength range being conventionally used.
- ▶ Specifically regarding claim 7, Mori's deep ultraviolet light wavelength is not longer than 200 nm, as recited in Col.1/ll.45-50 and Col.2/ll.6-13.
- ▶ Specifically regarding claim 9, Mori et al. teach in Col.1/ll.40-42 that KrF laser emitting at a wavelength of 248 nm is also usable for the same purpose.
- ▶ Regarding claims 11, 18 and 23, Mori's apparatus shown in Fig.1 further comprises means for holding a mask 20 (also known in the art as reticle) as recited in Col.6/ll.10-15, an illumination optical system for illuminating the mask/reticle with light 11 from a light source 10, as recited in Col.5/ll.50-53, and means 23 for holding a wafer 22 as recited in Col.6/ll.21-26, whereby semiconductor wafer is inherently understood in the devices recited in Col.1/ll.16-19.
- ▶ The limitation of claims 12, 20 and 25 does not restrict to reflective element only through the use of the wording "*or*" that inherently also allows a combination with refractive elements. Therefore, the limitation is completely covered by Mori's apparatus shown in Fig.1, which includes reflective element 18 and refractive element 21, as recited in numerous passages in Mori's disclosure.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-16 and new claims 19, 21, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (USPAT 6,268,904 B1) in view of general knowledge in the art.

► Regarding claims 14 and 15, the limitation of controlling the total amount of organic substance not to exceed $1 \mu\text{g}/\text{m}^3$, and that of each specific organic compound not to exceed $0.01 \mu\text{g}/\text{m}^3$, is well known in the art, and also inherent in Mori's absorption spectroscopy detection method, as implicated in Col.9/II.1-6 in regards of a first threshold for commencing the cleaning process, and in Col.9/II.26-29 in regards of a second threshold to terminate the cleaning process. Mori et al. would not be able to decide when to commence and when to terminate the cleaning process without knowing the absolute concentrations of specific organic contaminants tolerable in the system, as implicated in Col.2/II.1-16 and Col.17/II.67-68 & Col.18/II.1-19. To this effect, one of ordinary skill in the art would find it necessary to calibrate Mori's absorption spectroscopy method with absolute amount of contaminants in units of $\mu\text{g}/\text{m}^3$ as

specified by Applicant, the calibration conventionally being conducted with the help of mass spectroscopy, as generally known in the art.

It would have been obvious to one of ordinary skill in the art by the time the invention was made to calibrate & convert Mori's threshold values, which are not even considered important to mention in the disclosure for being so well known in the art, and conventionally expressed in part-per-billion (ppb) correlated to a particular transmission (or absorption) at a certain wavelength, into $\mu\text{g}/\text{m}^3$ units as specified by Applicant, since such conversion is trivial for being completely within the ordinary skill in the art.

► Regarding claims 16, 21 and 26, the limitation of exposing a wafer using the optical instrument of claim 11 is recited by Mori et al. in the Title, Abstract, Col.1/ll.20-23, and many others, whereas the further step of developing the wafer is inherent in Mori's exposure apparatus and method, as specifically recited in Col.1/line 24.

► Regarding claims 19 and 24, the limitation of using reflective optics only is well known in the art, for being conventional for deep UV wavelengths.

It would have been obvious to one of ordinary skill in the art by the time the invention was made to use reflective optics only for working with deep UV wavelengths, since conventional optics does not transmit at these wavelengths, and special refractive optics made of UV transmissive materials, such as CaF and MgF, is known to be strongly hygroscopic, thus limiting their lifetime and also the scope of their usage.

8. Alternatively, claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (USPAT 6,268,904 B1) in view of *Peterson et al.* (USPAT

5,315,793) and *Weinberg et al.* (USPAT 5,959,297), and further in view of general knowledge in the art.

The limitation of controlling the total amount of organic substance not to exceed 1 $\mu\text{g}/\text{m}^3$, and that of each specific organic compound not to exceed 0.01 $\mu\text{g}/\text{m}^3$, is well known in the art, and also inherent in Mori's absorption spectroscopy detection method, as implicated in Col.9/II.1-6 in regards of a first threshold for commencing the cleaning process, and in Col.9/II.26-29 in regards of a second threshold to terminate the cleaning process. Mori et al. would not be able to decide when to commence and when to terminate the cleaning process without knowing the absolute concentrations of specific organic contaminants tolerable in the system, as implicated in Col.2/II.1-16 and Col.17/II.67-68 & Col.18/II.1-19. To this effect, one of ordinary skill in the art would find it necessary to calibrate Mori's absorption spectroscopy method with absolute amount of contaminants in units of $\mu\text{g}/\text{m}^3$ as specified by Applicant, the calibration conventionally being conducted with the help of mass spectroscopy, more specifically with RGA, as taught by Peterson in Col.6/II.63-68 and Col.7/II.1-55, since the RGA is known to be more sensitive than other methods, including the GC/MS, for detecting low concentration levels of organic contaminants, as disclosed by Weinberg et al. in Col.3/II.51-58 & 65-68.

It would have been obvious to one of ordinary skill in the art by the time the invention was made to calibrate & convert Mori's threshold values, which are not even considered important to mention in the disclosure for being so well known in the art, and conventionally expressed in part-per-billion (ppb) correlated to a particular transmission

(or absorption) at a certain wavelength, into $\mu\text{g}/\text{m}^3$ units as specified by Applicant, since such conversion is trivial for being completely within the ordinary skill in the art.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- New claims 27-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically in claim 27, the limitation of using a photo-catalyst to generate a photochemical reaction and clean the ambience is not described in the specification beyond the ultra-short and completely non-descriptive phrase on page 17/II.2-3, which reads "*or wherein an optical catalyst may be used*".
- In order to proceed with this Office Action, the *photo-catalyst* recited in claim 27, which is further propagated to all dependent claims 28-31, is assumed by the Examiner as being no different than the *photo-catalyst as generally known in the art*. The lack of any technical description in Applicants' disclosure about the *photo-catalyst* is here regarded a tacit but inclusive acknowledgement from the Applicants' side, that such an arrangement is well known in the art, and is conventionally also employed for accomplishing a function that is also well known, i.e., commonly encountered, in the art.

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Under this condition, there is no legally valid justification, why a claim of using a device or arrangement well known in the art to accomplish an intended function also well known in the art should be valued as a patentable invention. *In order to acquire patentability, such an application must evidently produce a new and/or unexpected result, i.e., beyond the scope envisioned or anticipated by any prior art of record.*

One example of the many prior arts that describes the *photo-catalyst* as meant by Applicant in claims 27-31 is Hagiwara et al. (USPAT 5,685,895), which recites in Col.5/ll.11-67 and Col.6/ll.1-38 a *chemical filter* having the capability of removing organic contaminants for cleaning the air of an optical exposure apparatus, the latter being obvious in the title and Abstract. A *chemical filter* containing *photo-catalyst* activated by light to cause photo polymerization of volatile compound that would otherwise degrade the optical transmission of the illuminator in a micro lithographic system, whereby the polymerization product is then removed by a composite filter, is described by McClearly (USPAT 5,166,530) in the Abstract.

► Insofar the Examiner can ascertain beyond the above § 112 first paragraph rejections,

- Claim 27 recites the same limitations as claim 1, 17 or 22;
- Claim 28 recites the same limitations as claim 11, 18 or 23;
- Claim 29 recites the same limitations as claim 19 or 24;
- Claim 30 recites the same limitations as claim 12, 20 or 25; and
- Claim 31 recites the same limitations as claim 16, 21 or 26.

Consequently, claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. in view of Peterson et al. and/or Weinberg et al. and the general knowledge in the art, as previously applied to claims 1, 11, 12, 16 and 17-26, and further in view of Hagiwara et al. (USPAT 5,685,895) and McClearly (USPAT 5,166,530).

Note: This ground for rejection is equivalent to assuming Applicant's optical catalyst as being the same as Hagiwara's and/or McClearly's, which is 100% legitimate based on Applicant's disclosure. Any attempt to specify the optical catalyst narrower than Applicant's present definition as on page 17/II.2-3 will be considered as New Matter.

Final Rejection

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
May 23, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800